

REMARKS*Amendments to the Claims*

Claims 1-12 and 13-51 are pending. Claims 1, 4, 9, 15, 20, 26, 32, 33, 39, 42 and 50 were amended to specify that the erase block management data structure of each erase block of the plurality of erase blocks is for storage of data to manage status of two or more sectors of the erase block within the memory and that each sector contains a user data section and a control data section.

Examiner Interview Summary

In a telephonic conversation with the Examiner, Hong Chong Kim, on January 13, 2005, with the below-signed attorney, Andrew C. Walseth, the Examiner and Applicant's Representative discussed the Examiner's rejection of pending claims 1-12 and 13-51 in a Non-final Office Action mailed on November 4, 2004.

The Examiner and Applicant's Representative specifically discussed the Examiner's rejection of claims 1-12 and 13-51 under 35 U.S.C. § 102(e) as being anticipated by Itoh et al. (U.S. Patent No. 5,966,720) or under 35 U.S.C. § 103(a) as being unpatentable over Itoh et al. in combination with various references. The Examiner and Applicant's Representative also discussed Flash memory erase block management disclosed by Itoh et al. as compared to the erase block management disclosed in the Present Application.

The Examiner and Applicant's Representative agreed that Itoh et al. disclosed a memory which has sector management data structure stored in each sector of an erase block that describes that specific sector's status and logical address within the erase block and did not disclose an erase block management data structure in each erase block of a plurality of erase blocks of a non-volatile memory array, where the erase block management data structure is for storage of data to manage the status of the erase block within the memory. The Examiner indicated that if the Applicant's Representative amended the claims of the Present Application to claim one or more sectors with an erase block management data structure in a restricted area of the one or more sectors, wherein the erase block management data structure is for storage of data to manage the status of a plurality of sectors in the erase block, that the claims may be allowable. The Examiner also indicated that a further search would be required.

Applicant believes the foregoing Summary accurately reflects the substance and scope of the telephonic interview of January 13, 2005. Applicant requests notification if the Examiner disagrees with the accuracy or completeness of the Summary.

Claim Rejections Under 35 U.S.C. § 102

Claims 4-5, 9-12, 14-16, 18-20, 23-29, 32-38, 42-46 and 48 were rejected under 35 U.S.C. § 102(e) as being anticipated by Itoh et al. (U. S. Patent No. 5,966,720). Applicant notes that the issue date of Itoh et al. (October 12, 1999) is more than one year before the filing date of the Specification (August 24, 2001). The Applicant therefore respectfully submits that the Examiner's rejection is more properly placed under 35 U.S.C. § 102(b). Applicant respectfully traverses this rejection and feels that claims 4-5, 9-12, 14-16, 18-20, 23-29, 32-38, 42-46 and 48 are allowable for the following reasons.

Applicant respectfully maintains that Itoh et al. teaches a memory which has sector management data structure stored in each sector of an erase block that describes that specific sector's status and logical address within the erase block. Applicant notes that Itoh et al.'s sector management structure only manages the sector it is stored in, therefore it does not correspond to Applicant's block management data structure which manages the status, availability, and other management data used in managing the erase block as a whole; Itoh et al.'s structure does not store data to manage status or availability of an entire erase block. *See, e.g.,* Itoh et al., Figure 1, Element B(Block), Figure 3, column 4, lines 8-28, column 1, lines 30-53, and column 2, line 54 to column 3, line 13. Applicant therefore respectfully submits that Itoh et al. does not teach or disclose storing an erase block management data structure in each erase block of a plurality of erase blocks of a non-volatile memory array, where the erase block management data structure is for storage of data to manage two or more sectors and/or the status of the erase block within the memory.

Applicant's claim 4 recites, in part, "an erase block management data structure for storage of data to manage the status of two or more sectors of an erase block within the memory array arranged in the control data sections of a subset of sectors of each erase block of the plurality of erase blocks." As detailed above, Applicant submits that Itoh et al. fails to teach or disclose such a Flash memory device having an erase block management data structure for

storage of data to manage the status of two or more sectors of an erase block within the memory array. As such, Itoh et al. fails to teach or disclose all elements of independent claim 4.

Applicant's claim 9 recites, in part, "an erase block management data structure for storage of data to manage the status of two or more sectors of the erase block within the memory array arranged in the control data sections of a first set of sectors of each erase block of the plurality of erase blocks." As detailed above, Applicant submits that Itoh et al. fails to teach or disclose such a Flash memory device having an erase block management data structure for storage of data to manage the status of two or more sectors of the erase blocks within the memory array. As such, Itoh et al. fails to teach or disclose all elements of independent claim 9.

Applicant's claim 15 recites, in part, "an erase block management data structure arranged in the control data sections of a subset of sectors of each erase block of the plurality of erase blocks for storage of data to manage the status of two or more sectors of the erase block within the memory array, wherein each erase block of the plurality of erase blocks has an erase block state that is recorded in the erase block management data structure of the erase block." As detailed above, Applicant submits that Itoh et al. fails to teach or disclose such a Flash memory device having an erase block management data structure for storage of data to manage the status of two or more sectors of the erase blocks within the memory array. As such, Itoh et al. fails to teach or disclose all elements of independent claim 15.

Applicant's claim 20 recites, in part, "an erase block management data structure arranged in the control data sections of a first set of sectors of each erase block of the plurality of erase blocks, wherein the control circuit is adapted to store data to manage the usage status of two or more sectors of the erase block within the memory array in the erase block management data structure of each erase block." As detailed above, Applicant submits that Itoh et al. fails to teach or disclose such a Flash memory device having an erase block management data structure for storage of data to manage the status of two or more sectors of the erase blocks within the memory array. As such, Itoh et al. fails to teach or disclose all elements of independent claim 20.

Applicant's claim 26 recites, in part, "an erase block management data structure for storage of data to manage the status of two or more sectors of the erase block within the memory array arranged in the control data sections of a subset of sectors of each erase block of the plurality of erase blocks." As detailed above, Applicant submits that Itoh et al. fails to teach or disclose such a system and Flash memory device having an erase block management data

structure for storage of data to manage the status of two or more sectors of the erase blocks within the memory array. As such, Itoh et al. fails to teach or disclose all elements of independent claim 26.

Applicant's claim 32 recites, in part, "forming an erase block management data structure for storage of data to manage two or more sectors and/or erase block status within the memory array in the control data sections of a subset of sectors of each erase block of the plurality of erase blocks." As detailed above, Applicant submits that Itoh et al. fails to teach or disclose such a method. As such, Itoh et al. fails to teach or disclose all elements of independent claim 32.

Applicant's claim 33 recites, in part, "storing an erase block management data structure for storage of data to manage two or more sectors and/or erase block status in each erase block of a plurality of erase blocks of a Flash memory array, wherein each erase block contains a plurality of sectors and the erase block management data structure of each erase block is stored in a plurality of control data sections of a subset of the plurality of sectors, where each sector of the plurality of sectors contains a user data section and a control data section." As detailed above, Applicant submits that Itoh et al. fails to teach or disclose such a method. As such, Itoh et al. fails to teach or disclose all elements of independent claim 33.

Applicant's claim 42 recites, in part, "wherein the erase block management data structure stores data to manage two or more sectors and/or erase block status within the memory array, and where each sector of the plurality of sectors contains a user data section and a control data section." As detailed above, Applicant submits that Itoh et al. fails to teach or disclose such a method. As such, Itoh et al. fails to teach or disclose all elements of independent claim 42.

Applicant respectfully contends that claims 4, 9, 15, 20, 26, 32, 33 and 42 have been shown to be patentably distinct from the cited reference. As claims 5, 10-12, 14, 16, 18-19, 23-25, 27-29, 34-38, 43-46 and 48 depend from and further define claims 4, 9, 15, 20, 26, 32, 33 and 42, respectively, they are also considered to be in condition for allowance. Accordingly, Applicant respectfully requests withdrawal of the rejection under 35 U.S.C. § 102(b) and allowance of claims 4-5, 9-12, 14-16, 18-20, 23-29, 32-38, 42-46 and 48.

Claim Rejections Under 35 U.S.C. § 103

Claims 4, 9, 15, 20, 26, 32-33 and 42 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of Itoh et al. Applicant

respectfully traverses this rejection and feels that claims 4, 9, 15, 20, 26, 32-33 and 42 are allowable for the following reasons.

Applicant respectfully notes that, as stated above in regards to the rejection of independent claims 4, 9, 15, 20, 26, 32-33 and 42, Itoh et al. fails to teach a Flash memory that has an erase block management data structure for storage of data to manage the status of two or more sectors of the erase blocks that resides in the control data sections of a subset of sectors of each erase block. As such, Itoh et al. fails to teach or disclose independent claims 4, 9, 15, 20, 26, 32-33 and 42 and therefore does not teach or suggest all elements of claims 4, 9, 15, 20, 26, 32-33 and 42. In addition, Applicant respectfully maintains that the AAPA of Figure 1 teaches a Flash memory which stores erase block management data in non-volatile erase block management registers and tables 128 that are separate from the erase blocks 116 themselves. The Applicant respectfully maintains that the element 122, relied upon by the Examiner as an erase block management data structure, refers to a sector control data space 122 for use with management of the associated sector 118. The Specification states in reference to Figure 1, “[t]he RAM control registers and tables 114 are loaded at power up from the non-volatile erase block management registers and tables 128 by the control state machine 110. The Flash memory array 112 contains a sequence of erase blocks 116. Each erase block 116 contains a series of sectors 118 that include a user data space 120 and a control data space 122. The control data space 122 contains overhead information for operation of the sector, such as an error correction code (not shown).” *See, e.g.*, Specification, Figure 1 and Paragraph 11. Applicant therefore respectfully submits that the AAPA does not teach or disclose a non-volatile memory device which stores an erase block management data structure in each erase block of a plurality of erase blocks of a non-volatile memory array. Therefore combining the elements of Itoh et al. with the AAPA does not teach or suggest all elements of claims 4, 9, 15, 20, 26, 32-33 and 42. The Applicant therefore maintains that claims 4, 9, 15, 20, 26, 32-33 and 42 are thus allowable over the AAPA and Itoh et al., either alone or in combination.

Applicant respectfully contends that claims 4, 9, 15, 20, 26, 32, 33 and 42 have been shown to be patentably distinct from the cited reference. Accordingly, Applicant respectfully requests withdrawal of the rejection under 35 U.S.C. § 103(a) and allowance of claims 4, 9, 15, 20, 26, 32, 33 and 42.

Claims 6, 8, 39 and 41 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Itoh, et al., in view of Reasoner, et al. (U. S. Patent No. 5,608,684). Applicant respectfully traverses this rejection and feels that claims 6, 8, 39 and 41 are allowable for the following reasons.

Applicant respectfully notes that, as stated above in regards to the rejection of independent claim 4, from which claims 6 and 8 depend, Itoh et al. fails to teach a Flash memory that has an erase block management data structure for storage of data to manage the status of two or more sectors of the erase blocks that resides in the control data sections of a subset of sectors of each erase block. As such, Itoh et al. fails to teach or disclose independent claim 4 and therefore does not teach or suggest all elements of claims 6 and 8. In addition, Reasoner et al. also does not teach an erase block management data structure that resides in the control data sections of a subset of sectors of each erase block. Therefore combining the elements of Itoh et al. with Reasoner et al. does not teach or suggest all elements of claim 4. The Applicant therefore maintains that claim 4 is thus allowable over Itoh et al. and Reasoner et al., either alone or in combination. As claims 6 and 8 depend from and further define claim 4, claims 6 and 8 are also deemed allowable.

In regards to independent claim 39, the Applicant respectfully submits that, as stated above, Itoh et al. fails to teach a Flash memory that has an erase block management data structure for storage of data to manage the status of two or more sectors of the erase blocks within the memory array that resides in the control data sections of a subset of sectors of each erase block. As such, Itoh et al. fails to teach or suggest all elements of claim 39. In addition, Reasoner et al. also does not teach an erase block management data structure that resides in the control data sections of a subset of sectors of each erase block. Therefore combining the elements of Itoh et al. with Reasoner et al. does not teach or suggest all elements of claim 39. The Applicant therefore maintains that claim 39 is thus allowable over Itoh et al. and Reasoner et al., either alone or in combination. As claim 41 depends from and further defines claim 39, claim 41 is also deemed allowable.

Applicant respectfully contends that claims 6, 8, 39 and 41 as pending have been shown to be patentably distinct from the cited references, either alone or in combination. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) and allowance of claims 6, 8, 39 and 41.

Claims 7 and 40 were rejected under 35 U. S. C. § 103(a) as being unpatentable over Itoh et al., in view of Reasoner et al., and further in view of Duke (U. S. Patent 3,576,982). Applicant respectfully traverses this rejection and feels that claims 7 and 40 are allowable for the following reasons.

Applicant respectfully notes that, as stated above in regards to the rejection of independent claims 4 and 39 which claims 7 and 40 depend from, Itoh et al. fails to teach a Flash memory that has an erase block management data structure for storage of data to manage the status of two or more sectors of an erase block within the memory array that resides in the control data sections of a subset of sectors of each erase block. As such, Itoh et al. fails to teach or suggest independent claims 4 and 39 and therefore does not teach or suggest all elements of claims 7 and 40. In addition, Reasoner et al. and Duke do not teach an erase block management data structure that resides in the control data sections of a subset of sectors of each erase block. Therefore combining the elements of Itoh et al. with Reasoner et al. and Duke does not teach or suggest all elements of claims 4 and 39. The Applicant therefore maintains that claims 4 and 39 are thus allowable over Itoh et al., Reasoner et al. and Duke, either alone or in combination. As claims 7 and 40 depend from and further define claims 4 and 39, claims 7 and 40 are also deemed allowable.

Applicant respectfully contends that claims 7 and 40 as pending have been shown to be patentably distinct from the cited references, either alone or in combination. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) and allowance of claims 7 and 40.

Claims 22, 21 and 49 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Itoh et al. in view of AAPA. Applicant respectfully traverses this rejection and feels that claims 22, 21 and 49 are allowable for the following reasons.

Applicant respectfully notes that, as stated above in regards to the rejection of independent claims 20 and 42 which claims 22, 21 and 49 depend from, Itoh et al. fails to teach a Flash memory that has an erase block management data structure for storage of data to manage the status of two or more sectors of an erase block within the memory array that resides in the

control data sections of a subset of sectors of each erase block. As such, Itoh et al. fails to teach or suggest independent claims 20 and 42 and therefore does not teach or suggest all elements of claims 22, 21 and 49. In addition, as also stated above, the AAPA does not teach an erase block management data structure for storage of data to manage the status of the erase blocks within the memory array that resides in the control data sections of a subset of sectors of each erase block. Therefore combining the elements of Itoh et al. with the AAPA does not teach or suggest all elements of claims 20 and 42. The Applicant therefore maintains that claims 20 and 42 are thus allowable over Itoh et al., Reasoner et al. and Duke, either alone or in combination. As claims 22, 21 and 49 depend from and further define claims 20 and 42, claims 22, 21 and 49 are also deemed allowable.

Applicant respectfully contends that claims 22, 21 and 49 as pending have been shown to be patentably distinct from the cited references, either alone or in combination. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) and allowance of claims 22, 21 and 49.

Claims 1 and 3 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of Itoh et al. Applicant respectfully traverses this rejection and feels that claims 1 and 3 are allowable for the following reasons.

The Applicant respectfully submits that, as stated above, Itoh et al. fails to teach a Flash memory that has an erase block management data structure for storage of data to manage the status of two or more sectors of the erase blocks within the memory array that resides in the control data sections of a subset of sectors of each erase block. As such, Itoh et al. fails to teach or suggest all elements of independent claim 1. In addition, as also stated above, the AAPA does not teach an erase block management data structure for storage of data to manage the status of the erase blocks within the memory array that resides in the control data sections of a subset of sectors of each erase block. Therefore combining the elements of Itoh et al. with the AAPA does not teach or suggest all elements of claim 1. The Applicant therefore maintains that claim 1, as amended, is thus allowable over Itoh et al. and the AAPA, either alone or in combination. As claim 3 depends from and further defines claim 1, claim 3 is also deemed allowable.

Applicant respectfully contends that claims 1 and 3 as pending have been shown to be patentably distinct from the cited references, either alone or in combination. Accordingly,

Applicant respectfully requests reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) and allowance of claims 1 and 3.

Claim 2 was rejected under 35 U.S.C. § 103(a) as being unpatentable over AAPA in view of Itoh et al., and further in view of Duke. Applicant respectfully traverses this rejection and feels that claim 2 is allowable for the following reasons.

The Applicant respectfully submits that, as stated above in regards to claim 1, which claim 2 depends from, Itoh et al. fails to teach a Flash memory that has an erase block management data structure for storage of data to manage the status of two or more sectors of the erase blocks within the memory array that resides in the control data sections of a subset of sectors of each erase block. As such, Itoh et al. fails to teach or suggest all elements of independent claim 1. In addition, as also stated above, the AAPA and Duke do not teach an erase block management data structure for storage of data to manage the status of the erase blocks within the memory array that resides in the control data sections of a subset of sectors of each erase block. Therefore combining the elements of Itoh et al. with the AAPA and Duke do not teach or suggest all elements of claim 1. The Applicant therefore maintains that claim 1 is thus allowable over Itoh et al., the AAPA and Duke, either alone or in combination. As claim 2 depends from and further defines claim 1, claim 2 is deemed allowable.

Applicant respectfully contends that claim 2 as pending have been shown to be patentably distinct from the cited references, either alone or in combination. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) and allowance of claim 2.

Claims 17, 30-31, 47 and 50-51 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Itoh et al. in view of AAPA. Applicant respectfully traverses this rejection and feels that claims 17, 30-31, 47 and 50-51 are allowable for the following reasons.

The Applicant respectfully submits that, as stated above, Itoh et al. fails to teach a Flash memory that has an erase block management data structure for storage of data to manage the status of two or more sectors and/or the erase blocks within the memory array that resides in the control data sections of a subset of sectors of each erase block. As such, Itoh et al. fails to teach

or suggest all elements of independent claims 15, 26, 42 and 50. In addition, as also stated above, the AAPA does not teach an erase block management data structure for storage of data to manage the status of the erase blocks within the memory array that resides in the control data sections of a subset of sectors of each erase block. Therefore combining the elements of Itoh et al. with the AAPA does not teach or suggest all elements of claims 15, 26, 42 and 50. The Applicant therefore maintains that claims 15, 26, 42 and 50 are thus allowable over Itoh et al. and the AAPA, either alone or in combination. As claims 17, 30-31, 47 and 51 depend from and further defines claims 15, 26, 42 and 50, claims 17, 30-31, 47 and 51 are also deemed allowable.


Applicant respectfully contends that claims 17, 30-31, 47 and 50-51 as pending have been shown to be patentably distinct from the cited references, either alone or in combination. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) and allowance of claims 17, 30-31, 47 and 50-51.

CONCLUSION

If the Examiner has any questions or concerns regarding this application, please contact the undersigned at (612) 312-2207.

Respectfully submitted,

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